8.9 Agriculture and Soils

8.9.1 Introduction

This subsection describes the potential environmental effects on agriculture and soils from the proposed AES Highgrove Project. Potential impacts are assessed for the site construction and operation. Existing onsite groundwater wells will be used to provide process and cooling water. Process water will be disposed of offsite. A potable water line exists within Taylor Street on the eastern boundary of the site and connection to that line would serve as a backup water source. Connections for overhead power transmission lines would require approximately 600 feet of new 115-kV transmission line with the new towers being constructed onsite. Natural gas service would be supplied by a proposed 7-mile natural gas supply pipeline extending from the western side of the power plant site southward into Riverside County.

Subsection 8.9.2 presents the laws, ordinances, regulations, and standards (LORS) applicable to agriculture and soils. Subsection 8.9.3 describes the existing environment that could be affected, including agricultural use and soil types. Subsection 8.9.4 identifies potential environmental effects, if any, from project development, and Subsection 8.9.5 presents mitigation measures. Subsection 8.9.6 describes the required permits and provides agency contacts. Subsection 8.9.7 provides the references used to develop this subsection.

8.9.2 Applicable Laws, Ordinances, Regulations, and Standards

Federal, state, county, and local LORS applicable to agriculture and soils are discussed below and summarized in Table 8.9-1.

TABLE 8.9-1
Laws, Ordinances, Regulations, and Standards Applicable to Agricultural and Soil Resources

Jurisdiction	LORS	Purpose	Regulating Agency	Applicability (AFC Section Explaining Conformance)
Federal	Federal Water Pollution Control Act of 1972: Clean Water Act of 1977 (including 1987 amendments).	Regulates stormwater discharge from construction and industrial activities	RWQCB – Central Valley Region under State Water Resources Control Board	Subsections 8.9.2.1 and 8.9.4.2.
Federal	Natural Resources Conservation Service (1983), *National Engineering Handbook*, Sections 2 and 3.	Standards for soil conservation	Natural Resources Conservation Service	Subsections 8.9.2.1 and 8.9.5.
State	Porter-Cologne Water Quality Control Act of 1972; Cal. Water Code 13260-13269: 23 CCR Chapter 9.	Regulates stormwater discharge	California Energy Commission (CEC) and the Central Valley Region under State Water Resources Control Board	Subsections 8.9.2.2 and 8.9.4.2.

TABLE 8.9-1
Laws, Ordinances, Regulations, and Standards Applicable to Agricultural and Soil Resources

Jurisdiction	LORS	Purpose	Regulating Agency	Applicability (AFC Section Explaining Conformance)
Local	Zoning Code, Title 18 of the City of Grand Terrace Municipal Code, August 2001.	Describes land use designations and associated municipal codes including Agricultural Overlay Districts	City of Grand Terrace Planning and Community Development	Subsection 8.9.2.3.
Local	City of Grand Terrace Municipal Code	Regulates grading, erosion and sediment control for construction projects within City limits	City of Grand Terrace Planning and Community Development; Building and Safety; Engineering	Subsection 8.9.2.3.
Local	San Bernardino County Development Code, 1990	Describes local policies for agricultural and soil resources in unincorporated portions of county	Planning Commission Board of Supervisors Planning Department Agricultural Commissioner	Subsection 8.9.2.3.
Local	California Land Conservation (Williamson) Act of 1965	Provides financial incentives for conservation of agricultural lands	County Assessor Planning Department Planning Commission Board of Supervisors	Subsection 8.9.2.3.
Local	Riverside County Ordinance 457	Describes requirements for grading and encroachment permits	Building and Safety Department	Subsection 8.9.2.3.
Local	City of Riverside Municipal Code: Title 13 (Streets and Sidewalks); Title 14 (Public Utilities); and Title 17 (Grading)	Describes requirements for encroachment and utility easements, street opening permits, and general and specific permits	Planning Department and Public Works Department	Subsection 8.9.2.3.

8.9.2.1 Federal

8.9.2.1.1 Federal Water Pollution Control Act of 1972 and the Clean Water Act of 1977 The Federal Water Pollution Control Act of 1972, commonly referred to as the Clean Water Act (CWA) following amendment in 1977, establishes requirements for discharges of stormwater or waste water from any point source that would affect the beneficial uses of waters of the United States. The State Water Resources Control Board adopted one statewide National Pollution Discharge Elimination System (NPDES) General Permit that would apply to storm water discharges associated with construction, industrial, and municipal activities. The Regional Water Quality Control Board (RWQCB) is the administering agency for the NPDES permit program. The CWA's primary effect on agriculture and soils within the project area consist of control of soil erosion and sedimentation during construction, including the preparation and execution of erosion and sedimentation control plans and measures for any soil disturbance during construction.

8.9.2.1.2 USDA Engineering Standards The U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS), *National Engineering Handbook*, 1983, Sections 2 and 3 provide standards for soil conservation during planning, design, and construction activities. The project would need to conform to these standards during grading and construction to limit soil erosion.

8.9.2.2 State

8.9.2.2.1 California Porter-Cologne Water Quality Control Act The California Water Code requires protection of water quality by appropriate design, sizing, and construction of erosion and sediment controls. The discharge of soil into surface waters resulting from land disturbance may require filing a report of waste discharge (see Water Code Section 13260a).

8.9.2.3 Local

The City of Grand Terrace has established an ordinance for grading, erosion, and sediment control. This ordinance establishes permitting requirements and exemptions for general earthwork operations, sediment transport, and erosion control activities that can cause the discharge of pollutants into stormwater systems or watercourses.

The San Bernardino County General Plan and Development Code include elements describing policies and goals pertaining to agricultural land and conversion issues. These regulations do not apply to the Highgrove Project because the site and linear facilities (except the gas line) are within the incorporated portions of the City of Grand Terrace. Furthermore, the existing site is a former power plant and the proposed offsite linear features would not require any conversion of agricultural lands that would affect properties currently under a Williamson Act agreement.

The Riverside County Building and Safety Department is the lead agency for grading permits and for encroachment permits within Riverside County. Project plans are reviewed within the Building and Safety Department for approval of the grading permit (Yonos, 2005; Chan, 2005). When the projects may affect public rights-of-way, the project plans are forwarded to the Transportation and Land Management Department for review and approval of the encroachment permit (Yonos, 2005; Fletcher, 2005).

The City of Riverside Planning Department and Public Works Departments are the lead agencies for grading, street opening, and encroachment permits within the city. Project plans are reviewed within both of these departments, which are responsible for permit approvals. Decisions about whether a General Permit or Specific Permit are required are based on a review of the plans by the City Surveyor, who determines which city-owned facilities might be impacted (Young, 2005).

8.9.3 Environmental Setting

The Project Site is located within the City of Grand Terrace in an urban area that is zoned for Industrial use [M2] and has been mostly developed for commercial/light industrial uses. The Project Site is located between two rail lines, the Burlington Northern Santa Fe Railway (BNSF) to the west and the Union Pacific Railroad (UPRR) to the east. The property is bounded on the south by the Cage Park Property (a private park owned by AES Highgrove, LLC); on the west by theBNSF RR; on the east by Taylor Street, and on the north by land adjacent to Interstate 215 (I-215). The Project Site is the site of Southern California Edison's (SCE's) former Highgrove Generating Station, and consists of approximately 17.7 acres, as further described in Section 2, Project Description. The project will include demolition of the existing generation equipment and construction of the new facility. The new facility will be constructed on a parcel north of the generating equipment that once contained fuel oil tanks used for storage of fuel ("Tank Farm Property"). The 9.8 acre parcel on which the new facility will be constructed will comprise the Tank Farm Property and a small portion of land from the Generating Station Property (upon completion of a parcel split and lot-line adjustment).

An open drainage ditch located near the northern boundary of the Tank Farm Property conveys ephemeral or seasonal water flows from a culvert beneath Taylor Street and discharges to manhole #6, which drains to a tributary of the Santa Ana River.

The Highgrove Generating Station site includes four existing operational water supply wells. SCE owns a 3.1-acre electrical switchyard adjacent to the Project Site to which the new power plant would connect through approximately 600 feet of new 115-kV overhead transmission line. A potable water main is located about 1,300 feet south of the site in Main Street and would serve as a backup water source in addition to supplying domestic water needs and fire suppression. Natural gas will be supplied by an approximately 7-mile-long, 12-inch-diameter natural gas pipeline that would extend from the west side of the plant south into Riverside County. Because the gas line route will following existing roadways or other developed rights-of-way, the proposed project will not affect agricultural lands in the project area.

Agricultural land currently exists just east and northeast of the proposed site and extends approximately 800 feet north of the site to Van Buren Street and approximately 1,500 feet eastward to developed urban areas of Grand Terrace. These agricultural fields, currently used for row crop production, are not zoned as part of the Agricultural Overlay District of San Bernardino County and will be part of a proposed high school development plan for the properties along the east side of Taylor Street across from the Project Site. More information on the proposed high school is provided in Subsection 8.4, Land Use. Soil survey mapping units characterizing the types and distribution of soils within the project area, as shown on Figure 8.9-1, are taken from the Soil Survey of San Bernardino County, Southwestern Part, California (NRCS, 1980) and Soil Survey of Western Riverside Area, California (NRCS, 1971). The electronic shape files for these mapping units were downloaded from the NRCS web site. Detailed soil descriptions were developed from the soil survey publications (NRCS, 1971, 1980) and from the Official Soil Descriptions (OSD) web page (NRCS, 2005). Important farmland designations for the soil mapping units were taken from the Soil Candidate Listings for San Bernardino and Riverside counties from the Farmland Mapping and Monitoring Program (California Department of Conservation [CDC] 2005a, 2005b, 1995).

Data for the affected environment are summarized and presented below:

- Soil types within 1 mile of the site boundaries are identified in Figure 8.9-1. Soil types along the proposed natural gas supply pipeline are identified in Figure 8.9-2.
- Table 8.9-2 summarizes the characteristics of each of the individual soil mapping units identified on Figures 8.9-1 and 8.9-2. The table summarizes depth, texture, drainage, permeability, erosion hazard rating, land capability classification, and fertility as an indicator of its revegetation potential.
- Figures 8.9-3 and 8.9-4 show "Important Farmlands" as defined by the CDC (CDC, 2002) within 1mile of the site boundaries and along the proposed natural gas supply pipeline. The farmland mapping designated specific areas as follows: Prime Farmland; Farmland of Statewide Importance; Unique Farmland, Farmlands of Local Importance, Grazing Land, Urban and Built-Up Land, and Other Land.
- Soil series designated as "Prime Farmland" (or Farmland of Statewide Importance) are also listed in Table 8.9-2.

TABLE 8.9-2
Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description
San Bernardino County Soil Mapping Units (NRCS, 1980)	
GtC	**Greenfield sandy loam – slope class (2 to 9%)** • Prime Farmland • Well drained • Deep soils, gently sloping to moderately sloping • Formed on alluvial fans in moderately coarse textured granitic alluvium • Sandy loam surface, subsoil, and substratum • Permeability is moderately rapid (2.0 to 6.0 inches/hour) • Runoff is medium • Water erosion hazard is moderate if soil is unprotected • Soils are slightly acidic in surface and subsoil and neutral in substratum • Low shrink-swell potential • Capability Class IIe-1 irrigated • Taxonomic class: Coarse-loamy, mixed, thermic Typic Haploxeralfs • Elevation range from 1,200 to 3,400 feet

TABLE 8.9-2
Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description
HaC	**Hanford coarse sandy loam – slope class (2 to 9%)** • Prime Farmland • Well drained • Deep soils, gently sloping to moderately sloping • Formed on alluvial fans in recent granitic alluvium • Sandy loam surface, subsurface, and substratum • Permeability is moderately rapid (2.0 to 6.0 inches/hour) • Runoff is slow • Water erosion hazard is slight if soil is unprotected • Soils are slightly acidic to neutral throughout • Low shrink-swell potential • Capability Class IIe-1 irrigated • Taxonomic class: Coarse-loamy, mixed, non-acid, thermic Typic Xerorthents • Elevation range from 1,000 to 1,800 feet
HaD	**Hanford coarse sandy loam – slope class (9 to 15%)** Similar characteristics as noted above with the following differences: • Farmland of Statewide Importance • Strongly sloping soils on fans and terraces with short side slopes • Runoff is medium • Water erosion hazard is medium to high if soil is unprotected • Capability Class IIIe-1 irrigated
MoC	**Monserate sandy loam – slope class (2 to 9%)** The Project Site is located entirely within this soil mapping unit. • Farmland of Statewide Importance • Moderately well drained • Deep soils, gently sloping to moderately sloping • Formed in granitic alluvium on alluvial fans and terraces • Sandy loam surface and clay subsoil over indurated hardpan underlain by a coarse sandy loam substratum • Permeability is moderately slow in surface and substratum (2.0 to 6.0 inches/hour), slow in subsoil (0.2 to 0.6 inch/hour); very slow in hardpan (<0.06 inch/hour) • Runoff is medium • Water erosion hazard is slight to moderate if soil is unprotected • Soils are slightly acidic in surface, neutral in subsoil, and slightly alkaline below • Low shrink-swell potential in surface and substratum; moderate in subsoil • Capability Class IIIe-8 irrigated • Taxonomic class: Fine loamy, mixed, thermic Typic Durixeralfs • Elevation range from 800 to 1,200 feet

TABLE 8.9-2
Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description
RmC	**Ramona sandy loam - slope class (2 to 9%)** • Prime Farmland • Well drained • Deep soils, gently sloping to moderately sloping • Formed in granitic alluvium on alluvial fans and terraces • Sandy loam surface over loam/clay loam subsoil and sandy loam substratum • Permeability is moderately slow (2.0 to 6.0 inches/hour in surface and substratum and 0.2 to 0.6 inch/hour in subsoil) • Runoff is medium • Water erosion hazard is moderate if soil is unprotected • Soils are slightly acidic in surface and neutral below • Low shrink-swell potential in surface and substratum; moderate in subsoil • Capability Class IIe-1 irrigated • Taxonomic class: Fine loamy, mixed, thermic Typic Haploxeralfs • Elevation range from 1,000 to 3,000 feet
ShF	**Saugus sandy loam – slope class (30 to 50%)** The gas supply pipeline within Grand Terrace passes through this soil mapping unit. • Not listed as an Important Farmland soil • Well drained • Deep soils, steeply sloped • Formed on uplands in weakly consolidated sediment • Sandy loam surface and loam subsurface over weakly consolidated sediment in substratum • Permeability is moderate in surface (2.0 to 6.0 inches/hour) and slow in subsoil (0.6 to 2.0 inches/hour) • Runoff is rapid • Water erosion hazard is moderate to high if soil is unprotected • Soils are neutral in surface and slightly acidic below • Low shrink-swell potential in surface and moderate in subsoil • Capability Class VIIe-1 dryland • Taxonomic class: Coarse-loamy, mixed, non-acid, thermic Typic Xerorthents • Elevation range from 1,200 to 2,500 feet
Vr	**Vista-Rock outcrop complex – slope class (30 to 50%)** Soil properties given below pertain to the Vista series • Not listed as an Important Farmland soil • Well drained • Shallow to moderately deep soils over granitic rock, steeply sloped • Formed on upland foothills in material weathered from granitic rock • Sandy loam surface and subsoil over decomposed granitic subsurface • Permeability is moderately rapid (2.0 to 6.0 inches/hours) • Runoff is medium to rapid • Water erosion hazard is moderate • Slightly acidic surface soils becoming neutral with increasing depth • Low shrink-swell potential • Capability class VIIe-1 dryland • Taxonomic class: Coarse-loamy, mixed, superactive, thermic, Typic Haploxerepts • Elevation range from 1,200 to 3,500 feet

TABLE 8.9-2
Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description

Riverside County Soil Mapping Units (NRCS, 1971)

Note: All the following soil mapping units are along the proposed natural gas supply pipeline route.

AoA **Arlington fine sandy loam, deep – slope class (0 to 2%)**

- Prime Farmland
- Well drained
- Deep soils over a weakly cemented layer
- Formed on alluvial fans and terraces in alluvium dominantly from granitic rocks
- Fine sandy loam surface and subsurface over weakly cemented alluvium substratum
- Permeability is slow
- Runoff is slow
- Water erosion hazard is slight
- Natural fertility is moderate
- Slightly acidic to mildly alkaline surface; neutral to mildly alkaline subsoil and substratum
- Capability Class IIs-8 irrigated
- Taxonomic class: Coarse-loamy, mixed, thermic Haplic Durixeralfs
- Elevation range from 500 to 2,000 feet

AoC **Arlington fine sandy loam, deep – slope class (2 to 8%)**

Similar characteristics as noted above with the following differences:

- Also a Prime Farmland soil
- Runoff is medium
- Water erosion hazard is moderate
- Capability Class IIIe-1 irrigated

ApB **Arlington loam, deep, slope class (0 to 5%)**

Similar characteristics as noted above with the following differences:

- Farmland of Statewide Importance
- Loamy surface texture
- Runoff is slow to medium
- Water erosion hazard is slight to moderate
- Capability Class IIIe-8 irrigated

ArB **Arlington loam, deep, slope class (5 to 15%)**

Similar characteristics as noted above with the following differences:

- Prime Farmland
- Capability Class IIe-1 irrigated
- Water erosion hazard is slight to moderate

ArD **Arlington loam, deep, slope class (5 to 15%)**

Similar characteristics as noted above with the following differences:

- Not listed as an Important Farmland soil
- Runoff is medium
- Water erosion hazard is moderate

TABLE 8.9-2
Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description
BuC2	**Buren fine sandy loam, eroded – slope class (2 to 8%)** • Farmland of Statewide Importance • Moderately well drained • Moderately deep soils over a weakly cemented pan layer • Formed on alluvial fans and terraces in alluvium from mixed sources • Sandy loam surface and loam subsurface over weakly cemented loam substratum • Permeability is moderately slow • Runoff is medium • Water erosion hazard is moderate • Natural fertility is moderately high • Slightly acidic to moderately alkaline surface; neutral to moderately alkaline subsoil; moderately alkaline substratum • Capability Class IIIe-8 irrigated • Taxonomic class: Fine-loamy, mixed, thermic Haplic Durixeralfs • Elevation range from 700 to 3,000 feet
BuD2	**Buren fine sandy loam, eroded, slope class (8 to 15%)** Similar characteristics as noted above with the following differences: • Not listed as an Important Farmland soil • Loamy surface texture • Runoff is medium • Water erosion hazard is high • Capability Class IIIe-1 irrigated
FaD2	**Fallbrook sandy loam, eroded, slope class (8 to 15%)** • Farmland of Statewide Importance • Well drained • Shallow soils (approximately 2 feet) over a weathered bedrock • Formed in uplands on soils developed from granodiorite and tonalite • Sandy loam surface and loam to clay loam or sandy clay loam subsurface over weathered granodiorite or tonalite • Permeability is moderate • Runoff is medium • Water erosion hazard is moderate • Natural fertility is moderate • Slightly acidic to neutral surface; neutral subsoil; slightly acidic to neutral substratum • Capability Class IVe-1 irrigated • Taxonomic class: Fine-loamy, mixed, thermic Typic Haploxeralfs • Elevation range from 700 to 3,500 feet
FaE2	**Fallbrook sandy loam, eroded, slope class (15 to 25%)** Similar characteristics as noted above with the following differences: • Not listed as an Important Farmland soil • Runoff is rapid • Water erosion hazard is high

TABLE 8.9-2
Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description
GyC2	**Greenfield sandy loam, eroded – slope class (2 to 8%)** • Prime Farmland • Well drained • Deep soils • Formed on alluvial fans and terraces in alluvium dominantly from granitic materials • Sandy loam surface and subsurface over loam substratum • Permeability is moderate • Runoff is slow to medium • Water erosion hazard is slight to moderate • Natural fertility is high • Neutral surface, slightly acidic to mildly alkaline subsoil • Capability Class IIe-1 irrigated • Taxonomic class: Coarse-loamy, mixed, thermic Typic Haploxeralfs • Elevation range from 600 to 3,500 feet
HcA	**Hanford coarse sandy loam, slope class (0 to 2%)** • Prime Farmland • Well drained and somewhat excessively drained • Deep soils • Formed on alluvial fans in alluvium dominantly from granitic materials • Coarse or fine sandy loam surface over loamy sand subsurface • Permeability is moderately rapid • Runoff is slow • Water erosion hazard is slight • Natural fertility is moderate • Slightly acidic surface and slightly acidic to neutral substratum • Capability Class IIs-4 irrigated • Taxonomic class: Coarse-loamy, mixed, nonacid, thermic Typic Xerorthents • Elevation range from 700 to 2,500 feet
HcC	**Hanford coarse sandy loam – slope class (2 to 8%)** Similar characteristics as noted above with the following differences: • Also a Prime Farmland soil • Runoff is slow to medium • Water erosion hazard is slight to moderate • Capability Class IIe-1 irrigated
HgA	**Hanford fine sandy loam, slope class (0 to 2%)** Similar characteristics as noted above with the following differences: • Also a Prime Farmland soil • Fine sandy loam surface texture • Runoff is slow • Capability Class I-1 irrigated

TABLE 8.9-2
Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description
MaB2	**Madera fine sandy loam, eroded, slope class (2 to 5%)** • Farmland of Statewide Importance • Well drained • Shallow soil over a cemented hardpan layer with cementation decreasing with depth • Formed on dissected terraces and old alluvial fans in alluvium dominantly from granitic materials • Sandy loam surface and clay subsoil over indurated hardpan • Permeability is very slow • Runoff is slow to medium • Water erosion hazard is slight to moderate • Natural fertility is moderate • Slightly acidic to neutral surface over strongly alkaline subsurface • Capability Class IIIe-3 irrigated • Taxonomic class: Fine, montmorillonitic, thermic Typic Durixeralfs • Elevation range from 600 to 1,600 feet
MmB	**Monserate sandy loam – slope class (0 to 5%)** • Farmland of Statewide Importance • Well drained • Shallow soil over a cemented hardpan layer with cementation decreasing with depth • Formed on terraces and old alluvial fans in alluvium dominantly from granitic materials • Sandy loam surface and sandy clay loam subsoil over hardpan underlain by loamy sand substratum • Permeability is moderately slow above the nearly impervious pan layer • Runoff is slow • Water erosion hazard is slight • Natural fertility is moderate • Slightly acidic to neutral surface and subsurface over a mildly alkaline subsoil • Capability Class IIIe-8 irrigated • Taxonomic class: Fine loamy, mixed, thermic Typic Durixeralfs • Elevation range from 700 to 2,500 feet
MoC	**Mottsville loamy sand – slope class (0 to 5%)** • Prime Farmland • Excessively drained • Shallow soil over a cemented hardpan layer with cementation decreasing with depth • Formed on alluvial fans and valley fills in alluvium dominantly from igneous materials • Loamy sand surface and subsoil over loamy coarse sand substratum • Permeability is rapid • Runoff is medium • Water erosion hazard is moderate • Natural fertility is moderate • Slightly acidic to neutral throughout profile • Capability Class IIIs-4 irrigated • Taxonomic class: Sandy, mixed, mesic Torriorthentic Haploxeralfs • Elevation range from 3,500 to 6,000 feet
RsC	**Riverwash** • Not listed as an Important Farmland soil • Slopes of 0 to 8 percent in valley fills and on alluvial fans • Variable drainage • Depth is variable but generally 20 to 60 inches or more • Formed in the beds of the major streams or larger creeks • Sandy, gravelly, or cobbly textures • Slightly acidic to neutral throughout profile • Capability Class VIIIw-4 dryland

TABLE 8.9-2
Soil Mapping Unit Descriptions and Characteristics

Map Unit	Description
TeG	**Terrrace escarpments** • Not listed as an Important Farmland soil • Slopes of 30 to 75 percent • Formed in variable alluvium on terraces or barrancas • Unaltered alluvial outwash from granite, gabbro, metamorphosed sandstone, sandstone, or mica-schists • Variable drainage with soil profiles that are commonly truncated • May have exposed 'rim-pan', gravel, cobblestones, stones, or large boulders in variable quantities • Slightly acidic to neutral throughout profile • Capability Class VIIe-1 dryland
VsF2	**Vista coarse sandy loam, eroded, slope class (15 to 35%)** • Not listed as an Important Farmland soil • Well drained • Shallow soil over a cemented hardpan layer with cementation decreasing with depth • Formed on uplands from weathered granite and granodiorite • Coarse sandy loam surface and gravelly coarse sandy loam subsurface over weathered granite or granodiorite • Permeability is moderately rapid • Runoff is medium • Water erosion hazard is moderate • Natural fertility is moderate • Medium to slightly acidic surface and slightly acidic to neutral subsurface over weathered bedrock subsoil • Capability Class VIe-1 dryland • Taxonomic class: Coarse loamy, mixed, thermic Typic Xerochrepts • Elevation range from 1,000 to 3,500 feet

Notes:

Soil characteristics are based on soil mapping provided in the published soil surveys (NRCS, 1971, 1980) and a review of corresponding OSDs.

Soil map units described above are limited to those mapped by the NRCS in the vicinity (i.e., within 1 mile) of the project property boundaries or directly on the proposed natural gas supply pipeline route.

Important Farmland soils taken from the Farmland Mapping and Monitoring Program (FMMP) Soil Candidate Listing for Prime Farmland and Farmland of Statewide Importance for San Bernardino County and for Riverside County (both updated August 23, 2005).

8.9.3.1 Agricultural Land Uses within the Study Area

As previously mentioned, there are some agricultural fields on the east side of Taylor Street across from the Highgrove property that are currently farmed for row crops. These fields extend eastward toward the proposed alignment for Commerce Way beyond which are dense urban (industrial and residential) developments. The fields extend northward from existing industrial properties on the north side of Main Street and are bounded on the north by Van Buren Street. These agricultural fields are not mapped within the San Bernardino County Agricultural Overlay District (City of Grand Terrace, 1988, 2001) but are planned for conversion to a sports complex/playing fields associated with a proposed high school development for the properties along the east side of Taylor Street and the proposed Outdoor Adventure Center.

Other lands associated with agricultural use include orchards that are found along the natural gas supply pipeline route. One orchard property is found in Riverside on the east side of Iowa Avenue between Columbia Avenue and Marlborough Avenue, and runs beside the proposed pipeline route for approximately 600 feet. Other orchards, associated with the University of California at Riverside (UCR), are found along both sides of Iowa Street (extending south about 0.38 mile from Everton Place to Martin Luther King Boulevard), then west about 0.5 mile along Martin Luther King Boulevard, then south about 0.22 mile along Canyon Crest Drive. The 7-mile-long natural gas supply pipeline will follow existing roadways or other rights-of-way. For these reasons, there will be no direct impacts to agricultural lands resulting from the proposed Highgrove Project.

8.9.3.2 Soil Types within the Study Area

Table 8.9-2 provides the physical and chemical properties of the soil mapping units that are found in the vicinity of the proposed Project Site (i.e., within 1 mile of the property boundaries) and along the 7-mile natural gas supply pipeline. As shown on Figure 8.9-1, the entire Project Site is within a single soil mapping unit [**MoC**] Monserate sandy loam (2 to 9 percent slopes).

As shown on Figures 8.9-1 and 8.9-2, the natural gas supply pipeline would extend through to 50 percent slopes) within San Bernardino County. In Riverside County, the 19 soil mapping units traversed by the natural gas pipeline include 5 phases of the Arlington sandy loam/loam series (**AoA, AoC, ApB, ArB,** and **ArC**); 2 phases of the Buren fine sandy loam series (**BuC2** and **BuD2**); 2 phases of the Fallbrook sandy loam series (**FaD2** and **FaE2**); and 3 phases of the Hanford sandy loam series (**HcA, HcC,** and **HgA**), in addition to the following single soil series mapping units:

- [**GyC2**] Greenfield sandy loam, eroded (2 to 8 percent slopes);
- [**MaB2**] Madera fine sandy loam, eroded (2 to 8 percent slopes);
- [**MmB**] Monserate sandy loam (0 to 5 percent slopes);
- [**MoC**] Mottsville loamy sand (0 to 5 percent slopes);
- [**RsC**] Riverwash (0 to 8 percent slopes);
- [**TeG**] Terrace Escarpments (30 to 50 percent slopes); and
- [**VsF2**] Vista coarse sandy loam, eroded (15 to 35 percent slopes)

8.9.3.3 Important Farmlands within the Study Area

The designations of Important Farmlands in the project vicinity and along the 7-mile natural gas supply pipeline are shown on Figures 8.9-3 and 8.9-4 (CDC, 2002) and are also summarized in Table 8.9-2. These maps are derived from information provided from the Farmland Mapping and Monitoring Program administered by the Division of Land Resource Protection in the CDC.

The Important Farmlands Map (Figure 8.9-2) shows that the Project Site and most of the area within the 1-mile buffer is mapped as [D] Urban and Built Up Land. The next largest area within this buffer is the Loma Hills to the west that are mapped as [G] Grazing Land. An area mapped as [X] Other Land is located north and northeast of the Project Site along the southeast side of Interstate 395.

There are 3 types of Important Farmlands mapped within the 1-mile buffer that represent a relatively small proportion of the total area. The largest part of these Important Farmlands occurs to the south in Riverside County and include (in decreasing order): Prime Farmlands; Farmland of Local Importance; and Farmland of Statewide Importance. The agricultural fields just east of the Project Site are mapped as Prime Farmlands and Farmland of Statewide Importance. The other Important Farmlands are located well away from the Project Site west of Interstate 395 in San Bernardino County, or along the southern boundary of the nearby City of Highgrove, in Riverside County.

Along the proposed natural gas supply pipeline route, the majority of land (74 percent) is classified as [D] Urban and Built-up Land. The orchards associated with the UCR campus are classified as [P] Prime Farmland and constitute approximately 13 percent of the total pipeline length. The remaining 13 percent of the pipeline length is comprised of [X] Other Land and is found to the south of the UCR orchards and near the southern end of the proposed pipeline route.

Statistics from inventories of important farmlands in San Bernardino and Riverside counties in 2004 indicate that there were approximately 501,142 total acres of land classified as Prime Farmland, Farmlands of Statewide Importance, Unique Farmlands, or Farmlands of Local Significance (CDC, 2005c. Of these, San Bernardino County had 34,674 acres compared to 466,468 acres for Riverside County. There were net declines in important farmlands from the year 2002 to 2004 with an 8.9 percent decline (3,406 acres) in San Bernardino County and a 2.7 percent decline (12,810 acres) in Riverside County. Increases during the same time period in lands classified as Urban and Built-up Land were larger than the net losses in all agricultural lands (important farmlands plus grazing lands) for both counties during the 2002 to 2004 period.

As previously noted, the proposed project will not result in the conversion of any agricultural land because the pipeline will follow existing roadways and rights-of-way.

8.9.3.4 Soil Loss and Erosion

The factors that have the largest effect on soil loss include steep slopes, lack of vegetation, and erodible soils composed of large proportions of fine sands. The soils found in the Project Site and along the gas supply pipeline features are mostly level or follow roadways that are currently paved or otherwise covered by existing facilities.

In general, the soil types at the Project Site and along most of the gas supply pipeline, as indicated by the NRCS mapping (1971, 1980), have surface soil conditions that are relatively coarse grained (loamy sand, sandy loam, very fine sandy loam, or loam). The soil types and the slopes could have a relatively high potential for water and wind erosion. However, the erosion potential is lowered by the fact that the proposed areas where construction activities will occur is surrounded by other developed properties and buildings that will limit locally-significant ground-level winds that could lead to excessive wind erosion, and steep slopes are generally not present.

The majority of the Project Site will be located in an area that was formerly occupied by large oil tanks. Because the tanks were below grade to provide separate retention basins, the site is about 3 to 6 feet below the surrounding grade and includes a separating berm that will be removed. The southern portion of the site (the area where the former power plant is located) is nearly level due to previous grading associated with the former facility. Site grading will be required to allow the transition from the current ground surface to the lower tank basin grades. It is also expected that the previous site grading and construction activities has likely removed much of the original native surface soils and replaced them with compacted, structural fill to create suitable bearing surfaces for the former electrical facilities. Compacted structural fill would be expected to have lower susceptibility to wind and water erosion than the original native soils. Given the previous site development, nearly level topography, and the planned use of construction best management practices (BMPs), the overall potential for soil loss at the Project Site is slight. Despite the relatively low potential for soil loss with the use of BMPs, estimates for soil losses by water and wind erosion are provided in the following subsections.

BMPs will be used to minimize erosion at the site during construction. These measures typically include mulching, physical stabilization, dust suppression, berms, ditches, and sediment barriers. Water erosion will be minimized or mitigated through the use of sediment barriers and wind erosion potential will be reduced significantly by keeping soil moist or by covering soil piles with mulch or other wind protection barriers. These temporary measures would be removed from the site after the completion of construction. The final state of the site during operations will be completely paved or otherwise covered with facilities or landscaping so that soil erosion losses at that point would be negligible.

8.9.3.4.1 Water Erosion The water erosion hazard designations for soils in the project area are listed in Table 8.9-2. The water erosion hazard level ascribed to the Monserate sandy loam soil mapping unit on which the project is located is slight to moderate, indicating that water erosion hazard is likely to be minimal. This erosion hazard rating is associated with the sandy loam surface soils (if they are left exposed) and not the clay subsoil or indurated hardpan that underlies them. The moderate erosion hazard is also likely to be associated with unprotected natural soils with slopes near the high end of the 2 to 9 percent slope class.

The potential soil loss by water erosion for the project was estimated using the Revised Universal Soil Loss Equation (RUSLE2) software downloaded from the web site at [http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_index.htm]. Soil loss was calculated as tons/acre/year by the program and then multiplied by the site acreage and assumed construction period to get total soil loss in tons for the project duration. The estimated potential soil loss by water erosion is summarized in Table 8.9-3.

The estimate of soil loss by water erosion using the RUSLE2 software is based upon the rainfall erosivity (R-factors) developed from the 2-year, 6-hour point precipitation frequency data (upper limit of the 90 percent confidence interval) from the nearest National Weather Service station to the Project Site[1]. Area-specific soil mapping information was downloaded for both San Bernardino and Riverside counties.

[1] On line at: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html

TABLE 8.9-3
Estimated Soil Loss from Water Erosion [WPSAC please reformat for landscape to avoid truncation]

			Estimates Using Revised Universal Soil Loss Equation[a]		
Feature	**Activity**	**Duration (months)[b]**	**Soil Loss (tons) without BMPs**	**Soil Loss (tons) with BMPs**	**Soil Loss (tons/yr) No Project**
Site (18 acres)	Demolition	5	97.5	2.8	0.44
	Grading	2	84.0	1.1	0.17
	Construction	10	195.0	5.6	0.87
Gas Pipeline (4.34 acres)	Grading/excavation	6	2012	25.7	3.25
Total Project (site and pipeline corridor, 22.34 acres)	All activities listed above	14	2389	35.2	4.73

Notes:

a. Soil losses (tons/acre/year) are estimated using RUSLE2 software available on line [http://fargo.nserl.purdue.edu/rusle2_dataweb/RUSLE2_index.htm].
- The soil mapping unit data specific to each county were downloaded directly from the above-cited on line source.
- Soil loss (R-factors) were estimated using 2-year, 6-hour point precipitation frequency amount for the nearest National Weather Service station to the Project Site [on line at http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html].
- Estimates of actual soil losses use the RUSLE2 soil loss times the duration and the affected area. The No Project Alternative estimate does not have a specific duration so loss is given as tons/year.

b. The estimate of total project time is derived from the construction schedule shown in Table 8.8-8 and includes a 2-month overlap of the demolition, construction, and grading phases.

Project Assumptions as follows:
- The portion of the site that will be disturbed is 18 acres which includes the Project Site, laydown area, and grading in former tanks storage area.
- The pipeline trench is estimated at 5-foot width over its entire length and the estimate of soil loss along pipeline is integrated over entire 7.16-mile length.

RUSLE2 Assumptions as follows:

100-ft slope length. Estimated soil unit slope is the midpoint of the minimum and maximum of the unit slope class. Rock cover percent estimated to be zero throughout project area.

Construction/Demolition soil losses assume the following inputs: Management - Bare ground; Contouring - None, rows up and down hill; Diversion/terracing - None; Strips and Barriers - None.

Grading soil losses assume the following inputs: Management - Bare ground/rough surface; Contouring - None, rows up and down hill; Diversion/terracing - None; Strips and Barriers - None.

Construction with BMP soil losses assume the following inputs: Management - Silt fence; Contouring - Perfect, no row grade; Diversion/terracing - None; Strips and Barriers - 2 fences, 1 at end of RUSLE slope.

No Project soil losses assume the following inputs: Management - Dense grass, not harvested; Contouring - None, rows up and down hill; Diversion/terracing - None; Strips and Barriers - None.

It was assumed that 18 acres of the Project Site would be disturbed for demolition, re-grading, laydown area, and plant construction. For the gas pipeline, it was assumed that a 5-foot-wide trench would be needed for the 12-inch-diameter pipeline over the entire 7-mile length.

For the various activities, the following RUSLE2 assumptions were used:

- A 100-foot slope length was used with the slope estimates as the mid-point between the highest and lowest values of the slope class.
- Rock cover percent was assumed to be zero throughout the project area.
- For **Construction/Demolition** activities, the Management input was considered to be 'Bare ground;' the Contouring input was considered to be 'None, rows up and down hill;' the Diversion/terracing input was 'None;' and the Strips and Barriers input was 'None.'
- For **Grading** activities, the Management input was considered to be 'Bare ground/rough surface;' the Contouring input was considered to be 'None, rows up and down hill;' the Diversion/terracing input was 'None;' and the Strips and Barriers input was 'None.'
- For **Construction with BMPs**, the Management input was considered to be 'Silt fence;' the Contouring input was considered to be 'Perfect, no row grade;' the Diversion/terracing input was 'None;' and the Strips and Barriers input was '2 fences, 1 and the end of the RUSLE2 slope.'
- For the **No Project** soil loss estimate, the Management input was considered to be 'Dense grass, not harvested;' the Contouring input was considered to be 'None, rows up and down hill;' the Diversion/terracing input was 'None;' and the Strips and Barriers input was 'None.'

As shown in Table 8.9-3, if no construction BMPs were employed, the soil losses by water erosion during the project construction phases are estimated to be approximately 376.5 tons at the Project Site and 2,012 tons along the gas supply pipeline. Employing the basic soil erosion control BMP of silt fencing reduces these estimates by 97.5 percent to 9.5 tons at the Project Site and 99 percent to 25.7 tons along the gas supply pipeline, respectively. Additional use of BMPs would be expected to further reduce soil losses by water erosion to near insignificant levels. Some of the BMPs are described in the Draft Construction Stormwater Pollution Prevent Plan, contained in Appendix 8.14xx.

8.9.3.4.2 Wind Erosion The wind erosion hazard rating was not provided for the soil mapping units described in the soil surveys (NRCS 1971, 1980), and so, are not included in Table 8.9-2. The potential for wind erosion of surface material for the project was estimated by calculating the total suspended particulates that could be emitted from active grading activities and the wind erosion of exposed soil. The total site area and grading duration were multiplied by emission factors to estimate the total suspended particulate matter (TSP) emitted from the site.

Fugitive dust from site grading was calculated using the default particulate matter less than 10 microns in equivalent diameter (PM_{10}) emission factor used in Jones and Stokes (2003) and the ratio of fugitive TSP to PM_{10} published by the Bay Area Air Quality Management

District (BAAQMD, 2005). Fugitive dust resulting from the wind erosion of exposed soil was calculated using the emission factor in AP-42 (Table 11.9-4 in BAAQMD, 2005).

Mitigation measures, such as watering exposed surfaces, are used to reduce PM_{10} emissions during construction activities. The PM_{10} reduction efficiencies are taken from the South Coast Air Quality Management District (SCAQMD) CEQA Handbook (1993) and were used to estimate the effectiveness of the mitigation measures. Table 8.9-4 summarizes the mitigation measures and PM_{10} efficiencies applied to the emission calculations.

TABLE 8.9-4
Mitigation Measures for Fugitive Dust Emissions

Mitigation Measure	PM_{10} Emission Reduction Efficiency	Efficiency Applied
Water active sites at least twice daily	34-68%	50%
Enclose, cover, water twice daily, or apply non-toxic soil binders, according to manufacturer's specifications, to exposed piles (i.e., gravel, sand, dirt) with 5 percent or greater silt content	30-74%	50%

Source: SCAQMD, 1993 (Table 11-4).

Table 8.9-5 summarizes the estimated unmitigated and mitigated TSP emissions from the site and along the gas pipeline from grading and the wind erosion of exposed soil. Without mitigation, the maximum predicted erosion of material from the site with implementation of mitigation measures is estimated at 8.64 tons over the course of the project construction cycle. This estimate is reduced to approximately 4.32 tons by implementing basic mitigation measures (i.e., silt fences). These estimates are extremely conservative because they make use of emission rates for a generalized soil rather than for specific soil properties and assume the worse-case for blowing conditions.

TABLE 8.9-5
Estimated Unmitigated and Mitigated TSP Emissions from the Site and Along the Gas Pipeline

Emission Source	Area	Duration (months)	Unmitigated TSP (tons)	Mitigated TSP (tons)
Grading Dust:				
Project Site	18 acres	2	6.60	3.30
Gas pipeline	0.181 acre per 1/24th segment	6	0.20	0.10
Wind Blown Dust:				
Plant Site	6 acres	2	0.38	0.19
Laydown Area	1/2 of 5 acres	8	0.79	0.40
Storage Tank Area	7 acres	3	0.67	0.33

TABLE 8.9-5
Estimated Unmitigated and Mitigated TSP Emissions from the Site and Along the Gas Pipeline

Emission Source	Area	Duration (months)	Unmitigated TSP (tons)	Mitigated TSP (tons)
Estimated Total			**8.64**	**4.32**

Assumptions:

Assumes grading for entire site will be completed in a 2-month period overlapping the end of site demolition and plant construction.

The natural gas pipeline will be trenched within or adjacent to existing paved roadways and that a 5-ft wide trench will be adequate. It is expected that excavation and grading along the pipeline will be done in segments. The wind loss estimates are based upon1/24th segments (each 0.1808 acre) and that one segment will be open at all times during the entire 6-month construction window.

These estimates assume that wind erosion will occur only on exposed portions of the site and that plant site will be covered within 2 months after completion of grading; half of the soil area may be exposed through the 10-month construction window; and the storage tank area will have some temporary or permanent protection within 3 months after completion of grading.

Data Sources:

PM10 Emission Factor Source: Jones and Stokes URBEMIS2002 User's Guide, May 2003.

PM10 to TSP Conversion Factor Source: BAAQMD, 2005;

SCAQMD, 1993 (Table 11-4 for mitigation efficiency rates, as summarized in Table 8.9-4)

8.9.3.5 Other Significant Soil Characteristics

A significant soil characteristic concerning the proposed project is the potential for expansive clays in subsurface soils in the [**MoC**] Monserate sandy loam soil unit. This soil characteristic can pose a potential problem for construction of foundations and onsite pipelines because of the potential for soil movement due to shrink/swell characteristics. It is likely that unsuitable expansive clay soils have already been removed from the site where previous power generating facilities were constructed; however, there is a potential for these soils to occur in areas of the property that were not previously excavated. Construction problems with expansive clays can be avoided by backfilling those clayey portions of excavations for foundations, footings, or pipeline runs with a suitable, imported fill that has a low capacity for shrink/swell.

While the shrink/swell potential of different soil mapping units was not provided in the Riverside County soil survey (NRCS, 1971), it is expected that expansive subsurface soils could be encountered in any of the soils grouped into the 'Alfisol' soil order, where clayey subsurface layers occur. These would include all the soils listed in Table 8.9-2 for Riverside County except for the [**HcA, HcC,** and **HgA**] Hanford and [**VsF2**] Vista series soils, [**RsC**] Riverwash, and [**TeG**] Terrace escarpments.

Shallow soils over weathered bedrock or cemented hardpan, is another soil characteristic that could increase the difficulty and costs of excavation. This characteristic could be significant for the soil mapping unit underlying the Project Site, [**MoC**] Monserate sandy loam, as well as the following soil mapping units along the proposed gas pipeline route: [**FaD2** and **FaE2**] Fallbrook sandy loam, eroded; [**MaB2**] Madera fine sandy loam, eroded; [**MmB**] Monserate sandy loam; [**MoC**] Mottsville loamy sand; and [**VsF2**] Vista coarse sandy loam, eroded. Excavations within the [**TeG**] Terrace escarpment soil mapping units could also encounter a significant proportion of boulders that could also increase the difficulty and costs of excavation.

The [**MoC**] Monserate sandy loam soil mapping unit is a well drained soil, as are other soil units in the immediate project vicinity. There are no soils mapped in the project area that are classified as somewhat poorly or poorly drained, which could indicate hydric soil conditions. However, the drainage ditch near the northern site boundary and the stormwater detention basin within the park area in the southern portion of the site could be considered as jurisdictional wetlands if they satisfy U.S. Army Corps of Engineers criteria for wetland vegetation, hydrology, and soils or are linked to 'Waters of the U.S.' However, neither of these features will be affected by the project construction.

While the drainage class of the [**RsC**] Riverwash soil mapping unit was listed as variable, it is likely that this area is subject to regular (periodic) flooding and has a high probability of being a jurisdictional 'Waters of the U.S.' A pipeline crossing of this type of soil mapping unit could also require a Section 404 permit and may also be subject to a Streambed Alteration Agreement (Section 1601 permit) from the California Department of Fish and Game (see Subsection 8.2, Biological Resources).

Overall inherent soil fertility in the project area is indicated to be moderate to moderately high. However, in developed urban areas there is a strong possibility that much of the native surface soils have been mixed by grading or replaced with structural fill. For this reason, it is not possible to assess the actual soil fertility in the project area. To assure suitable soil fertility for revegetation success in the project area, it may be necessary to stockpile excavated topsoil; to add soil amendments to low fertility soils; or to import a suitable amended topsoil material.

8.9.4 Potential Environmental Analysis

The following subsections describe the potential environmental effects on agricultural production and soils during the construction and operation phases of the project. The potential for impacts to agricultural and soils resources were evaluated with respect to the criteria described in the Appendix G checklist of CEQA. An impact is considered potentially significant if it would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps for the Farmland Mapping and Monitoring Program by the California Resources Agency to non-agricultural use
- Conflict with existing zoning for agricultural use or a Williamson Act contract
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use
- Impact jurisdictional wetlands
- Result in substantial soil erosion

8.9.4.1 Impacts on Agricultural Soils

Construction of the project will be limited to the previously developed property. With the exception of the gas line and the potable water line, the linears are located adjacent to the site. The natural gas supply pipeline will be almost entirely limited to existing roadways and rights-of-way. As such, the proposed project will not remove any land from agriculture.

8.9.4.2 Construction

Project construction could potentially cause increased compaction of onsite soils in areas needed for facilities such as foundations, footings or onsite pipelines. In addition, the proposed project could result in a slight increase in soil erosion by water or wind. If this impact is not controlled, it could possibly increase the sediment load within surface waters downstream of the construction site or adversely impact local air quality from fugitive dust.

Construction of the Project Site would result in temporary soil compaction in parking, trailer, and laydown areas, and require potential dust control and erosion control measures. Approximately 18 acres on the site would be affected, almost all of which, has been previously impacted by the prior power plant development.

The amount of grading and filling will be determined by the need to smooth the transition from the current ground surface and the lower tank basins. Another factor affecting the grading and filling will be the amount of potentially unsuitable foundation material that might be encountered in the subsoil as it pertains to the site layout. Any excavated soils not reused during construction at the site would be managed or removed to prevent subsequent erosion and sedimentation issues.

Construction along the gas supply pipeline would involve excavation of soil materials from the pipeline trench, temporary stockpiling of these soil materials adjacent or nearby to the trench, compaction of soils placed beneath and above the installed pipeline, and temporary and permanent erosion control. Temporary stockpiling of excavated soil materials will segregate fertile topsoil from the subsoil so it can be reused for revegetation of the completed pipeline ground surface. Unsuitable pipeline bedding materials, such as expansive soils, will be removed and replaced with structural fill with suitable compaction and load bearing properties. Any excavated soils not reused during construction along the pipeline would be managed or removed to prevent subsequent erosion and sedimentation issues. As previously described, the proposed pipeline route will follow existing developed railroad and roadway rights-of-way.

The proposed construction will incorporate BMPs to the extent feasible and will follow appropriate plans to limit soil erosion and sedimentation. Because all plant construction will be limited to the previously developed Highgrove Generating Station site, and because the gas supply pipeline construction will follow existing developed rights-of-way, the proposed construction of the project will have a less than significant impact on soil resources and no impact on agricultural land use.

8.9.4.3 Operation

Project operation would not result in impacts to the soil from erosion or compaction. Routine vehicle traffic during project operation would be limited to existing paved roads. Standard operating activities would not involve the disruption of soil. Impacts to soil from project operations would be less than significant.

8.9.4.4 Effects of Generating Facility Emissions on Soil-Vegetation Systems

There is a concern in some areas that emissions from the generating facility, principally nitrogen (NO_x) from the combustors or drift from the cooling towers, would have an adverse effect on soil-vegetation systems in the project vicinity. This is principally a concern where environments that are highly sensitive to nutrients or salts, such as serpentine habitats, are downwind of the project.

In the case of the Highgrove Project, the dominant land uses downwind of the project are developed urban areas with limited areas in use for agriculture. There are no serpentine habitats in the project area. The addition of small amounts of nitrogen to agricultural areas would be insignificant within the context of fertilizers, herbicides, and pesticides typically used.

8.9.4.5 Cumulative Effects

The Project Site is located in the City of Grand Terrace in San Bernardino County. The site is current zoned for [M2] Industrial uses and has been previously developed for use for electrical power generation. For this reason, the potential cumulative impact of the project is considered to be less than significant to soil resources and will have no impact on agricultural resources.

8.9.5 Mitigation Measures

Erosion control measures would be required during construction to help maintain water quality, protect property from erosion damage, and prevent accelerated soil erosion or dust generation that could adversely affect local surface water or air quality. Temporary erosion control measures would be installed before construction begins, maintained and evaluated during construction, and then, would be removed from the site after the completion of construction.

8.9.5.1 Temporary Erosion Control Measures

Temporary erosion control measures would be implemented before construction begins, and would be evaluated and maintained during construction. These measures typically include revegetation, mulching, physical stabilization, dust suppression, berms, ditches, and sediment barriers. Vegetation is the most efficient form of erosion control because it keeps the soil in place and maintains the landscape over the long-term. Vegetation reduces erosion by absorbing raindrop impact energy and holding soil in place with fibrous roots. It also reduces runoff volume by decreasing erosive velocities and increasing infiltration into the soil.

Disturbed areas would be revegetated with rapidly growing restoration groundcover or landscaping materials as soon as possible after construction, with vehicle traffic kept out of revegetated areas. Physical stabilization, such as temporary erosion control matting, may be required depending on the time of year revegetation is performed. If required, revegetation of non-landscaped areas disturbed by construction of the linear facilities would be accomplished using locally prevalent, fast-growing plant species compatible with adjacent existing plant species.

During construction of the project, dust erosion control measures would be implemented to minimize the wind-blown erosion of soil from the site. Water of a quality equal to or better than either existing surface runoff or irrigation water would be sprayed on the soil in construction areas to control dust.

Sediment barriers, such as straw bales, sand bags, or silt fences, slow runoff and trap sediment. Sediment barriers are generally placed below disturbed areas, at the base of exposed slopes, and along streets and property lines below the disturbed area. Sediment barriers are often placed work areas to prevent migration to sensitive areas, such as wetlands, creeks, or storm drains, to prevent contamination by sediment-laden surface water run-off.

The site construction will occur on previously developed land whose separate portions are relatively level; therefore, it is not considered necessary to place barriers around the entire property boundary. However, some barriers would be placed in locations where offsite drainage could occur to prevent sediment from leaving the site. Barriers and other sedimentation control measures would be used to prevent runoff into storm drains or surface water channels located near the site. If used, straw bales would be properly installed (staked and keyed), then removed or used as mulch after construction. Runoff detention basins, drainage diversions, and other large-scale sediment traps are not considered necessary due to the level topography and surrounding paved areas. Any soil stockpiles would be stabilized and covered if left onsite for long periods of time, including placement of sediment barriers around the base of the stockpile.

8.9.5.2 Permanent Erosion Control Measures

Permanent erosion control measures on the site could include drainage and infiltration systems, detention basins, slope stabilization, and long-term revegetation or landscaping. Revegetation or landscaping would follow from planting for short-term erosion control.

A mitigation monitoring plan will be developed in conjunction with CEC staff to set performance standards and monitor the effectiveness of mitigation measures. This plan will address the timing and methods for monitoring plant establishment, as well as reporting and response requirements.

8.9.6 Permits and Agency Contacts

Permits required for the project, the responsible agencies, and proposed schedule are shown in Table 8.9-6.

TABLE 8.9-6
Permits and Agency Contacts for Agriculture and Soils

Permit or Approval	Schedule	Agency Contact	Applicability
City of Grand Terrace Grading Permit	At least 90 days prior to construction	John Lampe or Rich Shield, Planners Planning and Community Development City of Grand Terrace 22795 Barton Road Grand Terrace, CA 92324 909-430-2256	Grading of site surface
City of Riverside Encroachment Permit for Utility Easement	Prior to Construction	Dirk Jenkins, Senior Planner Planning Department City Of Riverside 3900 Main Street Riverside, CA 92522 951-826-5371	Utility encroachments in public roadways and rights-of way

TABLE 8.9-6
Permits and Agency Contacts for Agriculture and Soils

Permit or Approval	Schedule	Agency Contact	Applicability
City of Riverside Street Opening Permit and General or Specific Permit	Prior to Construction	Don Young, Plan Check Engineer Public Works Department City Of Riverside 3900 Main Street Riverside, CA 92522 951-826-5341	Excavations within roadways and utility encroachments across existing City facilities (e.g., water or utility)
Riverside County Grading Plan Approval and Permit	3 months prior to construction	Loi Chan, Grading Plan Reviewer Riverside County Building and Safety Department 4080 Lemon Street, 9^{th} Floor Riverside, CA 92501 951-955-9622	Grading for projects in unincorporated parts of Riverside County
Riverside County Plan review and encroachment permit	3 months prior to construction	Eric Fletcher, Riverside County Transportation and Land Management Department 4080 Lemon Street, 9^{th} Floor Riverside, CA 92501 951-955-6761	Grading or trenching in a public rights-of- way in unincorporated parts of Riverside County
Construction Activity, Stormwater and NPDES Permit	Prior to construction	Michelle Beckwith Santa Ana Regional Water Quality Control Board 3737 Main Street Suite 500 Riverside, CA 92501-3339 951-320-6396	Regulation of stormwater discharge from site and linear facilities during construction

8.9.7 References

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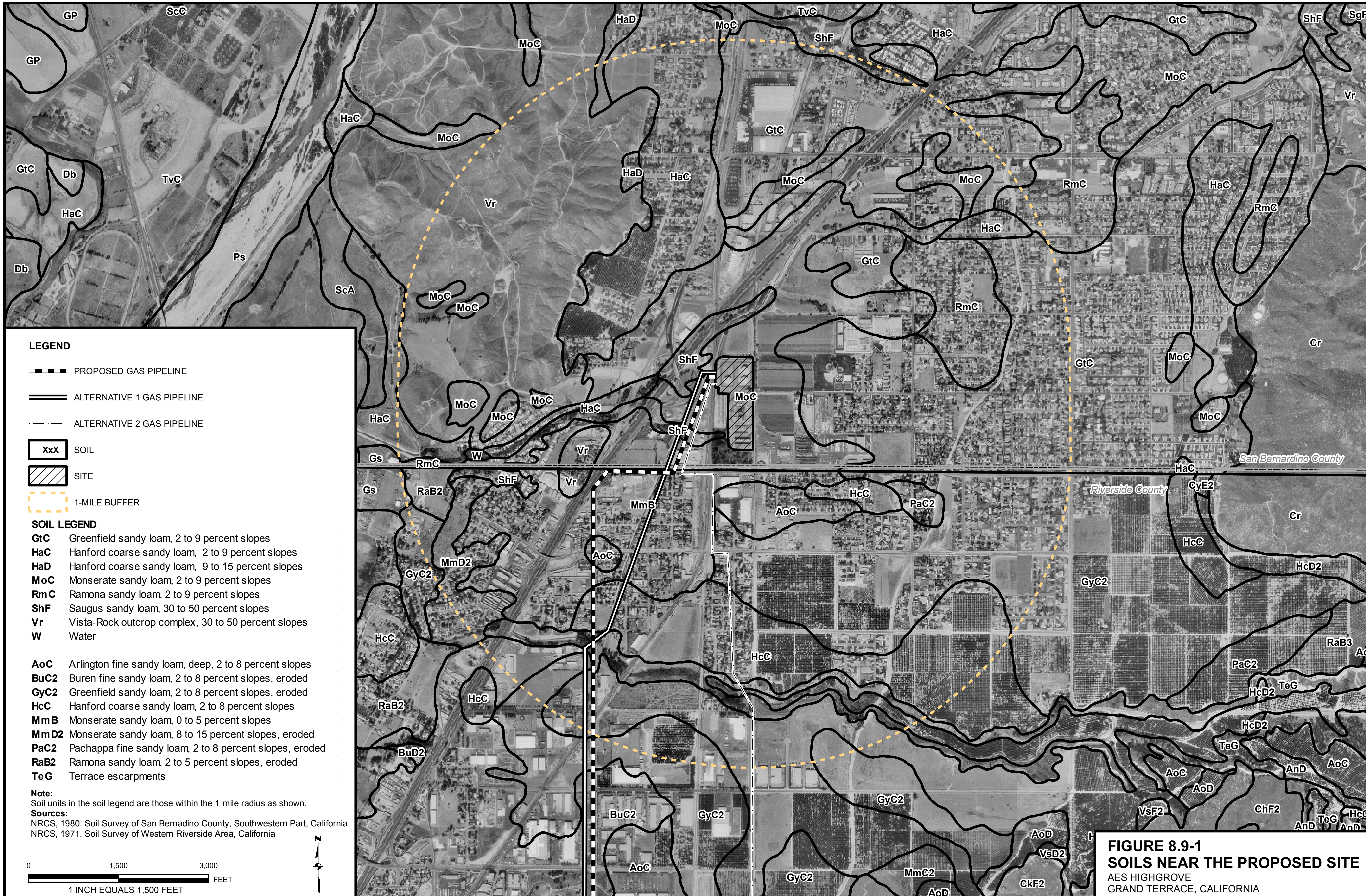
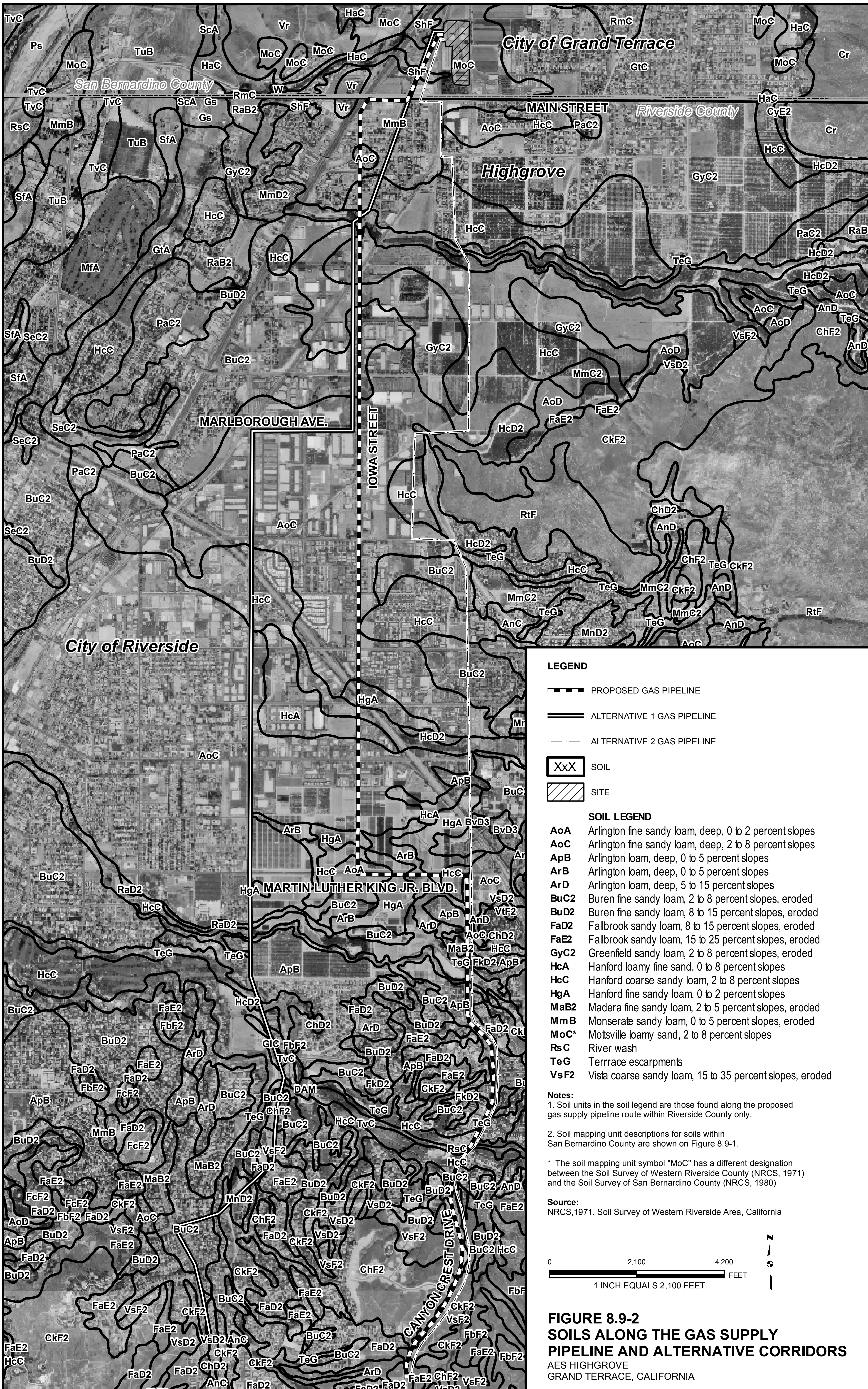


FIGURE 8.9-1
SOILS NEAR THE PROPOSED SITE
AES HIGHGROVE
GRAND TERRACE, CALIFORNIA

RDD \\LOKI\PROJECTS\RDDGIS\AES_HIGHGROVE\MXD\8_9-1_SOIL.MXD 4/7/2006 12:57:07



LEGEND

PROPOSED GAS PIPELINE

ALTERNATIVE 1 GAS PIPELINE

ALTERNATIVE 2 GAS PIPELINE

XxX SOIL

SITE

SOIL LEGEND

AoA	Arlington fine sandy loam, deep, 0 to 2 percent slopes
AoC	Arlington fine sandy loam, deep, 2 to 8 percent slopes
ApB	Arlington loam, deep, 0 to 5 percent slopes
ArB	Arlington loam, deep, 0 to 5 percent slopes
ArD	Arlington loam, deep, 5 to 15 percent slopes
BuC2	Buren fine sandy loam, 2 to 8 percent slopes, eroded
BuD2	Buren fine sandy loam, 8 to 15 percent slopes, eroded
FaD2	Fallbrook sandy loam, 8 to 15 percent slopes, eroded
FaE2	Fallbrook sandy loam, 15 to 25 percent slopes, eroded
GyC2	Greenfield sandy loam, 2 to 8 percent slopes, eroded
HcA	Hanford loamy fine sand, 0 to 8 percent slopes
HcC	Hanford coarse sandy loam, 2 to 8 percent slopes
HgA	Hanford fine sandy loam, 0 to 2 percent slopes
MaB2	Madera fine sandy loam, 2 to 5 percent slopes, eroded
MmB	Monserate sandy loam, 0 to 5 percent slopes, eroded
MoC*	Mottsville loamy sand, 2 to 8 percent slopes
RsC	River wash
TeG	Terrrace escarpments
VsF2	Vista coarse sandy loam, 15 to 35 percent slopes, eroded

Notes:

1. Soil units in the soil legend are those found along the proposed gas supply pipeline route within Riverside County only.

2. Soil mapping unit descriptions for soils within San Bernardino County are shown on Figure 8.9-1.

* The soil mapping unit symbol "MoC" has a different designation between the Soil Survey of Western Riverside County (NRCS, 1971) and the Soil Survey of San Bernardino County (NRCS, 1980)

Source:
NRCS,1971. Soil Survey of Western Riverside Area, California

0 2,100 4,200 FEET

1 INCH EQUALS 2,100 FEET

N

FIGURE 8.9-2
SOILS ALONG THE GAS SUPPLY PIPELINE AND ALTERNATIVE CORRIDORS

AES HIGHGROVE
GRAND TERRACE, CALIFORNIA

CH2MHILL

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FIGURE 8.9-3
IMPORTANT FARMLANDS NEAR THE PROPOSED SITE
AES HIGHGROVE
GRAND TERRACE, CALIFORNIA

CH2MHILL

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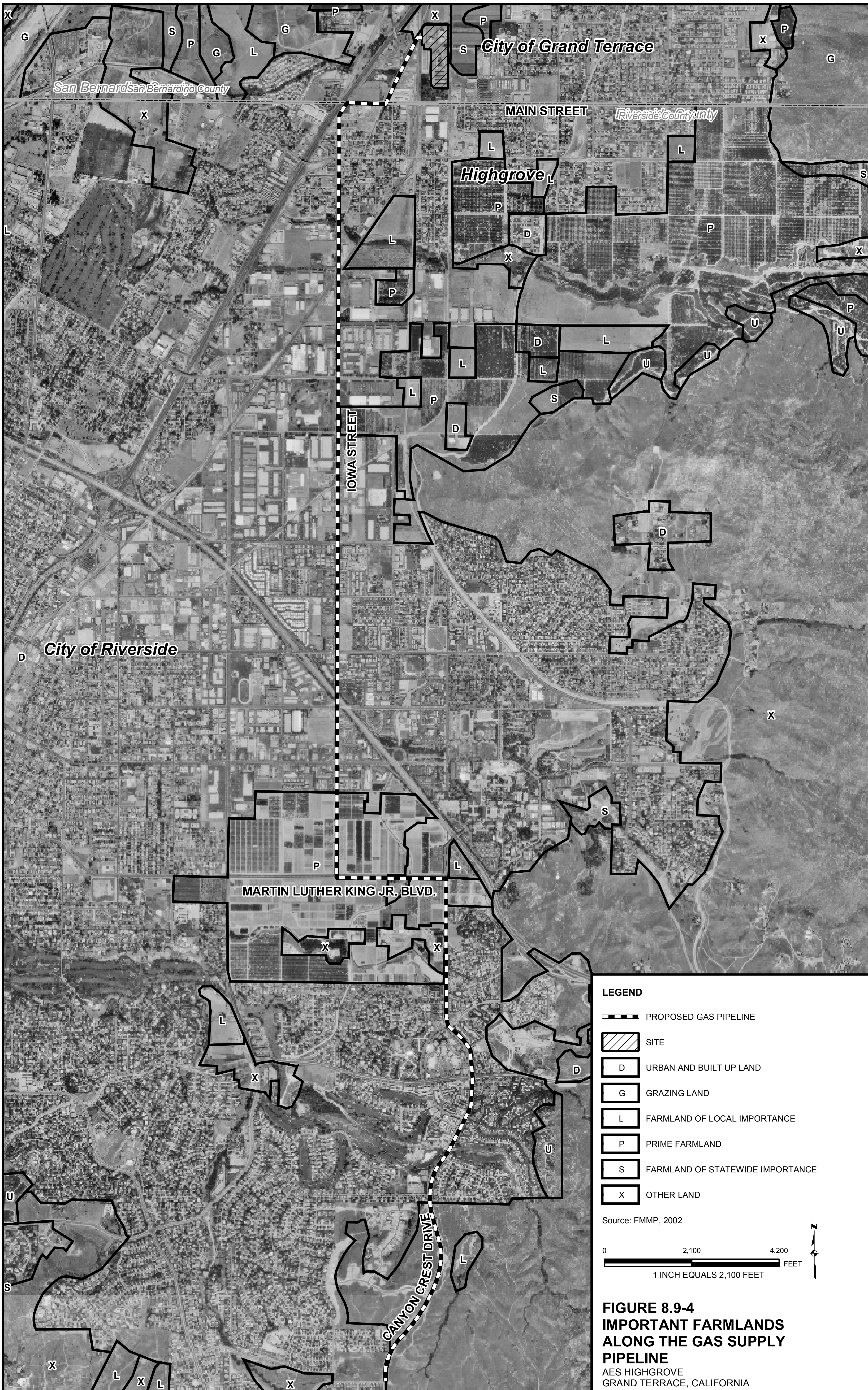

FIGURE 8.9-4
IMPORTANT FARMLANDS ALONG THE GAS SUPPLY PIPELINE
AES HIGHGROVE
GRAND TERRACE, CALIFORNIA

CH2MHILL

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